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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/734,388	12/11/2000	John V.W. Reynders	P5431	4232

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EXAMINER
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KANG, INSUN

ART UNIT	PAPER NUMBER
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2124

DATE MAILED: 01/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 09/734,388	<b>Applicant(s)</b> REYNDERS, JOHN V.W.	
	<b>Examiner</b> Insun Kang	<b>Art Unit</b> 2124	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 26 October 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-5,8-15 and 18-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5,8-15 and 18-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

1. This action is in response to the RCE amendment filed 10/26/2004.
2. As per applicant's request, claims 1-3, 9, 11-13, 19 and 22-24 have been amended and claims 6, 7, 16 and 17 have been cancelled. Claims 1-5, 8-15 and 18-24 are pending in the application.

### ***Claim Rejections - 35 USC § 112***

3. The rejection to claims 1-5, 8-15 and 18-24 has been withdrawn due to the amendment to the claims.

### ***Claim Rejections - 35 USC § 101***

4. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

5. Claims 1-5, 8-10, and 22 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claims 1-5, 8-10, and 22 are non-statutory because they are directed to a "method" merely reciting a "method for providing at least one self-tuning object to a user program." The claims do not recite a description of what the providing at least one self-tuning object actually was or how the steps such as using said at least one self-tuning object etc were conducted with respect to providing the self-tuning object. Causing an action or an intended action is different from actually performing an action. Therefore, the method for providing at least one self-tuning object is only an intended action. Thus

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the claims represent non-functional descriptive material that is not capable of producing a useful result, and hence represent only abstract ideas. Therefore, the claims are non-statutory.

Claim 22 is non-statutory because it is directed to a "computer data signal" without recitation of a computer or a computer-readable medium embodying the claimed steps. The claim merely recites a "computer data signal" that is disembodied arrangement so as to be called a "computer program" or compilation of facts, information, or data *per se*, without creating any functional interrelationship, either as part of the stored data or as part of the computing processes performed by the computer ("acts") or computer readable medium so as to enable the computer to perform the claimed steps as recited. Thus the claim represents non-functional descriptive material that is not capable of producing a useful result, and hence represents only abstract ideas. Therefore, the claim is non-statutory.

### ***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-5, 8-15 and 18-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chang (US patent 5,805,863), in view of Shah et al. (US Patent

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6,148,437) hereinafter referred to as "Shah," further in view of Wygodny et al. (US Pub. No. 2003/0088854) hereinafter referred to as "Wygodny."

Per claim 1:

Chang discloses:

- at least one self-tuning objects (Chang, i.e. "loops nests of up to two levels will be detected," col. 4 lines 1-7)
- receiving a user program (Chang, i.e., "the individual loops in the program are detected from the memory reference trace," col. 4 lines 1-7)

Chang does not explicitly teach simulating execution of said user program. However, Shah explicitly teaches an instruction emulator (Shah, i.e. "The instruction emulator of the jump-evaluating trace designator emulates...and mimics the operations that the CPU would have applied to the original instructions," col. 4 lines 5-15) for the purpose of accurately evaluating system performance and optimizing or fine-tuning a system. Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention was made to incorporate the teachings of Shah to the method of Chang. The modification would be obvious because simulating the execution of a program rapidly detects potential bottlenecks and hidden problems/weaknesses in a program design so that costly delays and errors can be minimized by more accurate forecasts and estimates before actual execution as applied in Shah (i.e. col. 4 lines 5-15).

Chang further discloses:

-detecting ... occurrences of expressions using said at least one self-tuning object in said user program (Chang, i.e., "the individual loops in the program are detected from the memory reference trace," col. 4 lines 1-7)

-generating for each occurrence, in response to said detecting, an entry in a trace file including data representing said expressions and reflecting an execution flow of said expressions in said user program during said simulating and enabling generation of source code corresponding to said expressions (i.e. Chang, "Upon execution of the program, the trace is generated. From the trace, the loops in the program are identified," col. 3 lines 10-25)

-dividing said trace file into a plurality of trace file blocks. A trace is a sequence of blocks (See also the definition of a trace in Shah, col. 2 lines 63-67). Accordingly, Chang anticipates this limitation.

Chang does not explicitly disclose converting said trace file blocks into source code expression blocks. However, Wygodny explicitly teaches that such conversion is known in the pertinent art at the time of the invention was made for the purpose of compiler optimization and parallel computation (Wygodny, i.e. the assembly level information in the trace log file is converted back to a source level format using the same debug information used to create the TCI file," paragraph 0058). Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention was made to incorporate the teachings of Wygodny to the method of Chang. The modification would be obvious because one having ordinary skill would be

motivated to achieve parallel computation and to apply various compiler optimization techniques (Wygodny, i.e. paragraph 0058).

Chang further discloses:

- generating a plurality of minimal timing, compiled expression blocks, each of said plurality of minimal timing, compiled expression blocks corresponding to a respective one of said source code expression blocks (Chang, i.e. a Upon execution of the program...the loops in the program are identified. For each loop, a number of dynamic performance parameters are computed relating to the memory references occurring within that loop. These parameters include dynamic memory usage information and cache statistics," col. 3 lines 10-32)
- said generating including, for each source code expression block,
- parameterizing the source code expression block to include at least one optimization parameter, the at least one optimization parameter being taken from parameters of self-tuning objects corresponding to entries in a trace file block from which said source code expression block was generated (Chang, i.e. "For each loop, the performance parameters are applied to each set of conditions...certain ones of the performance parameters associated with each memory reference in the loop, and any optimizations for which the corresponding set of conditions has been satisfied," col. 4 lines 18-29)
- iteratively selecting at least one value for said at least one optimization parameter, compiling said parameterized source code expression block in accordance with said selected at least one value for said at least one optimization parameter, and measuring an execution time of object code resulting from that compiling, and, one the basis of

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iteratively selecting, compiling and measuring, identifying the at least one value for said at least one optimization parameter that is associated with a minimal execution time for said compiled expression block (Chang, i.e. "For each loop, the performance parameters are applied to each set of conditions...certain ones of the performance parameters associated with each memory reference in the loop, and any optimizations for which the corresponding set of conditions has been satisfied," col. 4 lines 18-29) -linking said plurality of minimal timing, compiled expression blocks into said user program (Chang, i.e. "the tool...is embodied in the form of a library file which is linked to the program to be optimized prior to execution of the program. During execution of the program, the tool...receives as input a memory reference trace generated as the program is executed and outputs memory optimization suggestions and the performance parameters," col. 3 lines 34-43) as claimed.

Per claim 2:

The rejection of claim 1 is incorporated, and further, Chang teaches:

- detecting said occurrences of expressions using said at least one self-tuning object in said user program is performed by program code associated with at least one overloaded operator associated with said at least one self-tuning object (i.e. col. 4 lines 1-7) as claimed.

Per claim 3:



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This claim is another version of the claimed method discussed in claim 2, wherein all claim limitations also have been addressed and/or covered in cited areas as set forth the above.

Per claim 4:

The rejection of claim 1 is incorporated, and further, Chang teaches:

-dividing trace file into plurality of trace file blocks is performed such that a total amount of computational dependencies and synchronization requirements within said user program, including computational dependencies and synchronization requirements between trace file blocks are minimized (i.e. col. 4 lines 1-7)

Per claim 5:

The rejection of claim 1 is incorporated, and further, Chang teaches:

-dividing said trace file into said plurality of trace file blocks is performed responsive to user provided delimiters included within said user program (i.e. col. 4 lines 1-7).

Per claim 8:

The rejection of claim 1 is incorporated, and further, Chang teaches:

- linking of minimal timing compiled expression blocks to user program is responsive to execution of user program (Chang, i.e. "the tool...is embodied in the form of a library file which is linked to the program to be optimized prior to execution of the program. During execution of the program, the tool...receives as input a memory reference trace generated as the program is executed and outputs memory optimization suggestions and the performance parameters," col. 3 lines 34-43) as claimed.

Per claim 9:

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The rejection of claim 8 is incorporated, and further, Chang teaches:

- detecting during execution of user program, plurality of expressions including at least one self-tuning object in user program (Chang, i.e., "the individual loops in the program are detected from the memory reference trace," col. 4 lines 1-7)

Per claim 10:

The rejection of claim 9 is incorporated, and further, Chang teaches:

- scheduling minimal timing compiled expression blocks for execution on at least one processor of target parallel processing computer (Chang, i.e. "the tool...is embodied in the form of a library file which is linked to the program to be optimized prior to execution of the program. During execution of the program, the tool...receives as input a memory reference trace generated as the program is executed and outputs memory optimization suggestions and the performance parameters," col. 3 lines 34-43) as claimed.

Per claims 11-15 and 18-20, they are the product versions of claims 1-5 and 8-10, respectively, and are rejected for the same reasons set forth in connection with the rejection of claims 1-5 and 8-10 above.

Per claim 22, it is the computer data signal version of claim 1, respectively, and is rejected for the same reasons set forth in connection with the rejection of claim 1 above.

Per claim 23, it is the system version of claim 1, respectively, and is rejected for the same reasons set forth in connection with the rejection of claim 1 above.

Per claim 24, it is another system version of claim 1, respectively, and is rejected for the same reasons set forth in connection with the rejection of claim 1 above.

***Response to Arguments***


8. Applicant's arguments with respect to claims 1-5, 8-15 and 18-24 have been considered, however, they are moot in view of the new ground(s) of rejection.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Insun Kang whose telephone number is 571-272-3724. The examiner can normally be reached on M-F 9:30-6.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kakali Chaki can be reached on 571-272-3719. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

I. Kang  
Examiner  
1/18/2005

  
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